

MACHEREY-NAGEL

# CHROMABOND® HLB

Chromatography



## CHROMABOND® HLB

- Hydrophilic-lipophilic balanced phase
- Enhanced retention for polar compounds
- Consistent recoveries

**MACHEREY-NAGEL**

[www.mn-net.com](http://www.mn-net.com)



## Introduction

The enrichment of hydrophilic analytes from polar matrices is a challenge because they often cannot be retained by C<sub>18</sub>/C<sub>8</sub>-modified silica or hydrophobic polymer adsorbents. To overcome this issue MACHEREY-NAGEL developed CHROMABOND® HLB, a hydrophilic-lipophilic balanced *N*-vinylpyrrolidone-divinylbenzene copolymer. Its lipophilic backbone interacts with nonpolar hydrocarbon residues of the analytes while the linked hydrophilic groups interact with polar functional groups to provide enhanced retention.

## Typical applications

Polar organic molecules from polar matrices e.g.,

- Sulfonamides
- Pesticides
- Chloramphenicol
- Iodinated contrast media

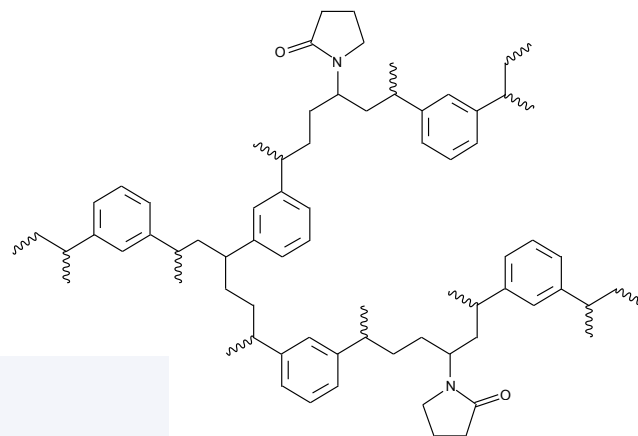
## Advantages of CHROMABOND® HLB

- Applicable for a wide range of analyte polarities
- Enhanced retention for polar compounds
- High loadability and outstanding performance
- Water wettable – even if bed runs dry, SPE can be continued
- The alternative to Oasis® HLB

## Technical data

Hydrophilic-lipophilic balanced *N*-vinylpyrrolidone-divinylbenzene copolymer

|                   |                       |
|-------------------|-----------------------|
| Particle shape:   | spherical             |
| pH stability:     | 1–14                  |
| Particle size:    | 60 µm and 30 µm       |
| Pore size:        | 65 Å                  |
| Specific surface: | 750 m <sup>2</sup> /g |



### Standard SPE protocol (subsequent HPLC analysis)

MN Appl. No. 306300

|                      |   |
|----------------------|---|
| Column:              | CHROMABOND® HLB, 3 mL, 200 mg           |
| MN REF:              | 730924                                  |
| Column conditioning: | 5 mL methanol, 5 mL dest. water         |
| Sample application:  | slowly aspirate sample through column   |
| Washing:             | 5 mL dest. water                        |
| Drying:              | 10 min with applied vacuum              |
| Elution:             | 8 mL methanol                           |
| Evaporation:         | under nitrogen                          |
| Reconstitution:      | in 1 mL dest. water + 0.1 % formic acid |

### Standard SPE protocol (subsequent GC analysis)

MN Appl. No. 306310

|                      |   |
|----------------------|---|
| Column:              | CHROMABOND® HLB, 3 mL, 200 mg   |
| MN REF:              | 730924  |
| Column conditioning: | 5 mL solvent (e.g., ethyl acetate), 5 mL methanol, 5 mL dest. water               |
| Sample application:  | slowly aspirate sample through column   |
| Washing:             | 5 mL dest. water  |
| Drying:              | 10 min with applied vacuum  |
| Elution:             | solvent <sup>1)</sup> (typical solvents: ethyl acetate, MTBE, methylene chloride) |
| Evaporation:         | under nitrogen, dry with sodium sulfate <sup>2)</sup> , adjust to final volume    |


<sup>1)</sup> usually nonpolar, therefore often 10 % methanol are added

<sup>2)</sup> e.g., with CHROMAFIX® Dry




## Pharmaceuticals from serum

MN Appl. No. 306510

|   |                      |   |
|---|----------------------|---|
|  | Columns*:            | CHROMABOND® HLB, 1 mL, 30 mg<br>Oasis® HLB, 1 mL, 30 mg |
|   | MN REF:              | 730921  |
|   | Column conditioning: | 1 mL methanol, 1 mL dest. water                         |
|   | Sample application:  | 1 mL serum (spiked with 50 ng of each analyte)          |
|   | Washing:             | 1 mL dest. water  |
|   | Drying:              | 10 min with applied vacuum                              |
|   | Elution:             | 2 mL methanol   |
|   | Evaporation:         | under nitrogen, 40 °C                                   |
|   | Reconstitution:      | in 1 mL dest. water – acetonitrile (95:5, v/v)          |

Further analysis: LC-MS/MS, according to MN Appl. No. 128200

|   |              |   |
|---|--------------|---|
|  | Column:      | EC 50/2 NUCLEOSHELL® PFP, 2.7 µm  |
|   | MN REF:      | 763532.20   |
|   | Eluent:      | A: dest. water + 0.1 % formic acid<br>B: acetonitrile + 0.1 % formic acid<br>5–95 % B in 7.5 min, 95 % B for 1 min,<br>95–5 % B in 0.5 min, 5 % B for 5 min |
|   | Flow rate:   | 0.3 mL/min  |
|   | Temperature: | 30 °C   |
|   | Detection:   | MS, Selected Reaction Monitoring (SRM)  |
|   | Injection:   | 5 µL  |


Recovery rates ± RSD [%], n = 5

| Compound         | CHROMABOND® HLB | Oasis® HLB |
|------------------|-----------------|------------|
| Amitriptyline    | 77.7 ± 1.2      | 26.9 ± 0.8 |
| Atenolol         | 71.2 ± 1.3      | 71.1 ± 1.2 |
| Atropine         | 84.8 ± 0.9      | 80.5 ± 1.4 |
| Carbamazepine    | 97.7 ± 0.3      | 57.7 ± 4.4 |
| Chlorpheniramine | 85.9 ± 2.2      | 91.7 ± 1.2 |
| Clomipramine     | 73.6 ± 6.7      | 48.1 ± 0.8 |
| Diphenhydramine  | 88.3 ± 2.1      | 94.7 ± 1.3 |
| Indapamide       | 87.7 ± 3.3      | 49.0 ± 2.0 |
| Ketamine         | 90.8 ± 1.8      | 88.4 ± 2.0 |
| Ketoprofen       | 84.1 ± 3.1      | 48.9 ± 1.6 |

| Compound              | CHROMABOND® HLB | Oasis® HLB  |
|-----------------------|-----------------|-------------|
| Nortriptyline         | 76.6 ± 2.1      | 14.9 ± 3.5  |
| Propranolol           | 107.7 ± 1.4     | 108.3 ± 1.7 |
| Sulfachloropyridazine | 85.8 ± 1.6      | 84.0 ± 1.4  |
| Sulfadoxine           | 99.8 ± 2.0      | 91.2 ± 2.0  |
| Sulfamethoxazole      | 94.3 ± 1.6      | 81.2 ± 1.6  |
| Sulfapyridine         | 64.6 ± 1.8      | 61.6 ± 3.9  |
| Sulfaquinoxaline      | 127.1 ± 3.4     | 104.8 ± 2.8 |
| Sulfamerazine         | 67.3 ± 0.8      | 63.4 ± 3.7  |
| Trimipramine          | 81.5 ± 2.3      | 37.3 ± 1.2  |
| Verapamil             | 107.5 ± 1.7     | 48.9 ± 0.9  |

## Drugs from tap water

MN Appl. No. 306330

|   |                      |  |
|---|----------------------|--|
|  | Columns*:            | CHROMABOND® HLB, 3 mL, 200 mg<br>Oasis® HLB, 3 mL, 200 mg          |
|   | MN REF:              | 730924   |
|   | Column conditioning: | 5 mL methanol, 5 mL dest. water                                    |
|   | Sample application:  | 1000 mL tap water (spiked with 5 µg/L of each analyte), ~10 mL/min |
|   | Washing:             | 5 mL dest. water   |
|   | Drying:              | 10 min with applied vacuum   |
|   | Elution:             | 8 mL methanol  |
|   | Evaporation:         | under nitrogen, 40 °C  |
|   | Reconstitution:      | in 1 mL dest. water + 0.1 % formic acid                            |

Further analysis: HPLC, according to MN Appl. No. 128110  
see Drugs from serum, page 7

Recovery rates ± RSD [%], n = 5

| Compound              | CHROMABOND® HLB | Oasis® HLB |
|-----------------------|-----------------|------------|
| Azidothymidine        | 98.2 ± 0.7      | 96.9 ± 0.8 |
| Caffeine              | 84.2 ± 0.9      | 67.9 ± 0.9 |
| <i>trans</i> -doxepin | 78.5 ± 0.9      | 64.5 ± 0.9 |
| <i>cis</i> -doxepin   | 81.3 ± 1.3      | 62.7 ± 0.6 |
| Propranolol           | 93.7 ± 0.9      | 83.7 ± 1.2 |
| Protriptyline         | 78.2 ± 2.9      | 60.2 ± 2.3 |

### CHROMABOND® HLB for polar analytes



CHROMABOND® HLB provides high recovery rates for polar drugs from water.

\* Same conditions for all used columns. Due to a better comparability CHROMABOND® HLB and Oasis® HLB adsorbents (60 µm) were packed into equal column hardware. The shown chromatograms may not be representative of other applications.

## Sulfa drugs from serum

MN Appl. No. 306340

|                      |   |
|----------------------|---|
| Columns*:            | CHROMABOND® HLB, 1 mL, 30 mg<br>Oasis® HLB, 1 mL, 30 mg |
| MN REF:              | 730921  |
| Column conditioning: | 1 mL methanol, 1 mL dest. water                         |
| Sample application:  | 1 mL serum (spiked with 10 µg/mL of each analyte)       |
| Washing:             | 1 mL dest. water  |
| Drying:              | 10 min with applied vacuum                              |
| Elution:             | 2 mL methanol   |
| Evaporation:         | under nitrogen, 40 °C                                   |
| Reconstitution:      | in 1 mL dest. water + 0.1 % formic acid                 |

Further analysis: HPLC, according to MN Appl. No. 128130

|              |  |
|--------------|--|
| Column:      | EC 150/2 NUCLEODUR® C <sub>18</sub> Pyramid, 3 µm                                  |
| MN REF:      | 760261.20  |
| Eluent:      | dest. water + 0.1 % formic acid – methanol + 0.1 % formic acid (85:15, v/v), 5 min |
| Flow rate:   | 0.6 mL/min   |
| Temperature: | 25 °C  |
| Detection:   | UV, 254 nm   |
| Injection:   | 5 µL   |

Recovery rates ± RSD [%], n = 5

| Compound      | CHROMABOND® HLB | Oasis® HLB |
|---------------|-----------------|------------|
| Sulfadiazine  | 97.3 ± 2.9      | 92.0 ± 3.8 |
| Sulfamerazine | 94.4 ± 1.8      | 92.8 ± 1.6 |
| Sulfathiazole | 90.3 ± 2.9      | 89.6 ± 1.5 |

### Equivalence to Oasis® HLB

CHROMABOND® HLB shows equivalent recovery rates to Oasis® HLB for the three tested sulfa drugs.



## Chloramphenicol from honey

MN Appl. No. 306350

|                      |   |
|----------------------|---|
| Columns*:            | CHROMABOND® HLB, 3 mL, 200 mg<br>Oasis® HLB, 3 mL, 200 mg   |
| MN REF:              | 730924  |
| Sample preparation:  | Weigh out 5 g of honey. Add 4 mL water and shake rigorously for 30 sec. Spike with 1 mL standard solution (c = 5 ng/mL in methanol) and shake rigorously for 30 sec. Add 15 mL ethyl acetate and shake rigorously for 30 sec. Centrifuge at 3000 rpm for 10 min. Take 12 mL of supernatant for eluent exchange. Evaporate extracts to dryness at 40 °C under a stream of nitrogen. Redissolve residue in 10 mL water. |
| Column conditioning: | 3 mL methanol (dispensing speed 1 mL/min), 5 mL dest. water (disp. speed 1 mL/min)  |
| Sample application:  | 9 mL water sample (disp. speed 3 mL/min over sample loop)   |
| Washing:             | 10 mL dest. water (disp. speed 3 mL/min)  |
| Drying:              | 100 mL air (disp. speed 100 mL/min)   |
| Elution:             | 5 mL ethyl acetate – methanol (80:20, v/v)  |
| Drying:              | 100 mL air (disp. speed 100 mL/min)   |
| Evaporation:         | under nitrogen, 40 °C   |
| Reconstitution:      | in 1 mL dest. water – acetonitrile (95:5, v/v)  |

The SPE application was performed with a FREESTYLE® SPE automation system.

Further analysis: LC-MS/MS, according to MN Appl. No. 128140

|              |  |
|--------------|--|
| Column:      | EC 150/2 NUCLEODUR® π <sup>2</sup> , 5 µm  |
| MN REF:      | 760624.20  |
| Eluent:      | A: dest. water<br>B: acetonitrile<br>5–95 % B in 7.5 min, 95 % B for 1 min, 95–5 % B in 1 min, 5 % B for 5 min |
| Flow rate:   | 0.3 mL/min   |
| Temperature: | 35 °C  |
| Detection:   | MS, Selected Reaction Monitoring (SRM)   |
| Injection:   | 5 µL   |

Recovery rates ± RSD [%], n = 5

| Compound           | CHROMABOND® HLB | Oasis® HLB |
|--------------------|-----------------|------------|
| Chloramphenicol-d5 | 90.9 ± 5.4      | 90.0 ± 9.3 |

### Good to know

Antibiotics and pesticides contamination of agricultural products such as honey has been an issue in the recent years and resulted in stricter guidelines in food safety control.




\* Same conditions for all used columns. Due to a better comparability CHROMABOND® HLB and Oasis® HLB adsorbents (60 µm) were packed into equal column hardware. The shown chromatograms may not be representative of other applications.




## Pesticides from tap water

MN Appl. No. 306360

|   |                      |   |
|---|----------------------|---|
|  | Columns*:            | CHROMABOND® HLB, 3 mL, 200 mg<br>Oasis® HLB, 3 mL, 200 mg |
|   | MN REF:              | 730924  |
|   | Column conditioning: | 5 mL methanol, 5 mL dest. water                           |
|   | Sample application:  | 1000 mL tap water (spiked with 50 ng of each analyte)     |
|   | Washing:             | 10 mL dest. water   |
|   | Drying:              | 5 min with applied vacuum ( -15 psi)                      |
|   | Elution:             | 6 mL acetonitrile   |
|   | Evaporation:         | under nitrogen, 40 °C                                     |
|   | Reconstitution:      | in 1 mL dest. water – acetonitrile (95:5, v/v)            |

Further analysis: LC-MS/MS, according to MN Appl. No. 128150

|   |              |  |
|---|--------------|--|
|  | Column:      | EC 50/2 NUCLEOSHELL® PFP, 2.7 µm   |
|   | MN REF:      | 763532.20  |
|   | Eluent:      | A: dest. water + 0.1 % formic acid<br>B: acetonitrile + 0.1 % formic acid<br>5–95 % B in 15 min, 95 % B for 5 min,<br>95–5 % B in 1 min, 5 % B for 9 min |
|   | Flow rate:   | 0.3 mL/min   |
|   | Temperature: | 40 °C  |
|   | Detection:   | MS, Selected Reaction Monitoring (SRM)   |
|   | Injection:   | 5 µL   |

Recovery rates ± RSD [%], n = 5

| Compound             | CHROMABOND® HLB | Oasis® HLB   |
|----------------------|-----------------|--------------|
| Acetamidrid          | 73.3 ± 5.0      | 112.1 ± 9.9  |
| Atrazine             | 110.3 ± 17.8    | 114.0 ± 11.6 |
| Azoxystrobin         | 74.7 ± 5.4      | 98.1 ± 10.8  |
| Carbaryl             | 65.7 ± 5.4      | 69.1 ± 7.1   |
| Chlorotoluron        | 82.7 ± 5.7      | 101.2 ± 3.8  |
| Chlorpyrifos         | 50.3 ± 5.4      | 47.0 ± 3.7   |
| Clofentezine         | 27.8 ± 2.7      | 21.4 ± 3.7   |
| Clothianidin         | 69.4 ± 6.5      | 52.9 ± 2.9   |
| Coumaphos            | 69.8 ± 4.8      | 82.3 ± 5.2   |
| Cyanazine            | 99.8 ± 9.3      | 85.1 ± 7.2   |
| Desethylatrazine     | 94.8 ± 15.1     | 87.4 ± 11.4  |
| Desisopropylatrazine | 92.5 ± 7.6      | 0            |
| Diazinon             | 71.5 ± 7.9      | 73.3 ± 4.7   |
| Difenoconazole       | 83.9 ± 6.5      | 28.8 ± 5.0   |
| Diuron               | 70.0 ± 4.8      | 80.1 ± 8.4   |
| Ethoprophos          | 72.4 ± 9.3      | 85.4 ± 7.2   |
| Hexazinone           | 88.4 ± 7.7      | 104.3 ± 7.4  |

| Compound           | CHROMABOND® HLB | Oasis® HLB   |
|--------------------|-----------------|--------------|
| Imazalil           | 27.3 ± 15.7     | 0            |
| Imidacloprid       | 93.4 ± 5.1      | 40.3 ± 5.2   |
| Isoproturon        | 100.2 ± 4.2     | 102.8 ± 13.0 |
| Linuron            | 84.5 ± 7.6      | 88.3 ± 9.5   |
| Methabenzthiazuron | 72.5 ± 5.3      | 48.0 ± 3.7   |
| Methomyl           | 78.8 ± 5.4      | 83.6 ± 5.6   |
| Metobromuron       | 73.8 ± 5.6      | 85.6 ± 9.3   |
| Metolachlor        | 79.0 ± 5.2      | 89.2 ± 5.0   |
| Monolinuron        | 75.4 ± 6.2      | 97.9 ± 7.2   |
| Myclobutanil       | 101.8 ± 11.4    | 88.7 ± 14.5  |
| Phosalone          | 63.8 ± 7.7      | 74.0 ± 4.0   |
| Piperonylbutoxide  | 101.4 ± 8.6     | 99.7 ± 7.9   |
| Propazine          | 102.1 ± 13.6    | 90.9 ± 9.4   |
| Propyzamide        | 84.8 ± 7.1      | 86.4 ± 10.6  |
| Terbutylazine      | 107.9 ± 13.3    | 100.0 ± 13.6 |
| Thiacloprid        | 74.1 ± 6.3      | 86.5 ± 10.8  |



\* Same conditions for all used columns. Due to a better comparability CHROMABOND® HLB and Oasis® HLB adsorbents (60 µm) were packed into equal column hardware. The shown chromatograms may not be representative of other applications.

## Iodinated contrast media from serum

MN Appl. No. 306370

Columns\*: CHROMABOND® HLB, 1 mL, 30 mg  
Oasis® HLB, 1 mL, 30 mg

MN REF: 730921

Column conditioning: 1 mL methanol, 1 mL dest. water

Sample application: 1 mL serum (spiked with 10 µg/mL of each analyte)

Washing: 1 mL dest. water

Drying: 10 min with applied vacuum

Elution: 2 mL methanol

Evaporation: under nitrogen, 40 °C

Reconstitution: in 1 mL dest. water + 5 mM ammonium formate

Further analysis: HPLC, according to MN Appl. No. 128160

Column: EC 150/2 NUCLEODUR® C<sub>18</sub> Gravity-SB, 3 µm

MN REF: 760608.20

Eluent: A: dest. water + 5 mM ammonium formate  
B: methanol/acetonitrile, (1:2, v/v) + 5 mM ammonium formate  
7–10 % B in 5 min, 10–100 % B in 5 min, 100 % B for 10 min

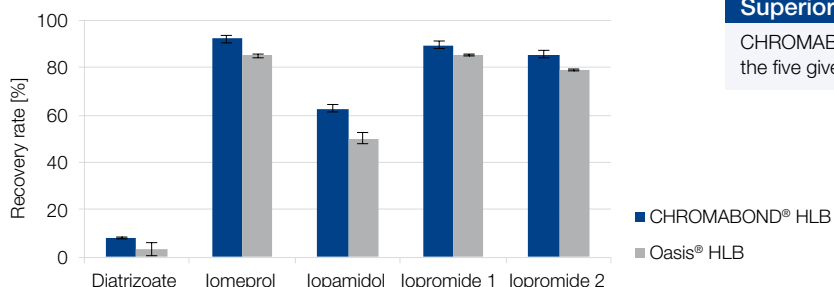
Flow rate: 0.2 mL/min

Temperature: 40 °C

Detection: UV, 254 nm

Injection: 5 µL

Recovery rates ± RSD [%], n = 5



### Superior to Oasis® HLB

CHROMABOND® HLB provides higher recovery rates for the five given analytes from serum in comparison to Oasis® HLB.

## Tetracyclines and alkaloids from serum at pH 5

MN Appl. No. 306380

Columns\*: CHROMABOND® HLB, 1 mL, 30 mg  
Oasis® HLB, 1 mL, 30 mg

MN REF: 730921

Column conditioning: 1 mL methanol, 1 mL dest. water

Sample application: 1 mL serum pH 5, adjusted with formic acid (spiked with 20 µg/mL of each analyte)

Washing: 1 mL dest. water

Drying: 10 min with applied vacuum

Elution: 2 mL methanol

Evaporation: under nitrogen, 40 °C

Reconstitution: in 1 mL dest. water + 0.1 % formic acid

Further analysis: HPLC, according to MN Appl. No. 128170

Column: EC 50/2 NUCLEOSHELL® RP 18plus, 2.7 µm

MN REF: 763232.20

Eluent: A: dest. water + 0.1 % formic acid  
B: acetonitrile + 0.1 % formic acid  
2–60 % B in 4 min, 60 % B for 1 min, 60–2 % B in 0.5 min, 2 % B for 3 min

Flow rate: 0.75 mL/min

Temperature: 22 °C

Detection: UV, 330 nm

Injection: 5 µL


Recovery rates ± RSD [%], n = 4

| Compound          | CHROMABOND® HLB | Oasis® HLB |
|-------------------|-----------------|------------|
| Berberine         | 85.4 ± 0.3      | 82.5 ± 0.6 |
| Chlortetracycline | 72.1 ± 1.4      | 66.3 ± 2.8 |
| Hydrastine        | 88.9 ± 2.6      | 99.3 ± 5.7 |
| Oxytetracycline   | 82.3 ± 1.4      | 78.7 ± 1.4 |
| Tetracycline      | 78.1 ± 1.4      | 70.7 ± 2.6 |


\* Same conditions for all used columns. Due to a better comparability CHROMABOND® HLB and Oasis® HLB adsorbents (60 µm) were packed into equal column hardware. The shown chromatograms may not be representative of other applications.

## Drugs from serum

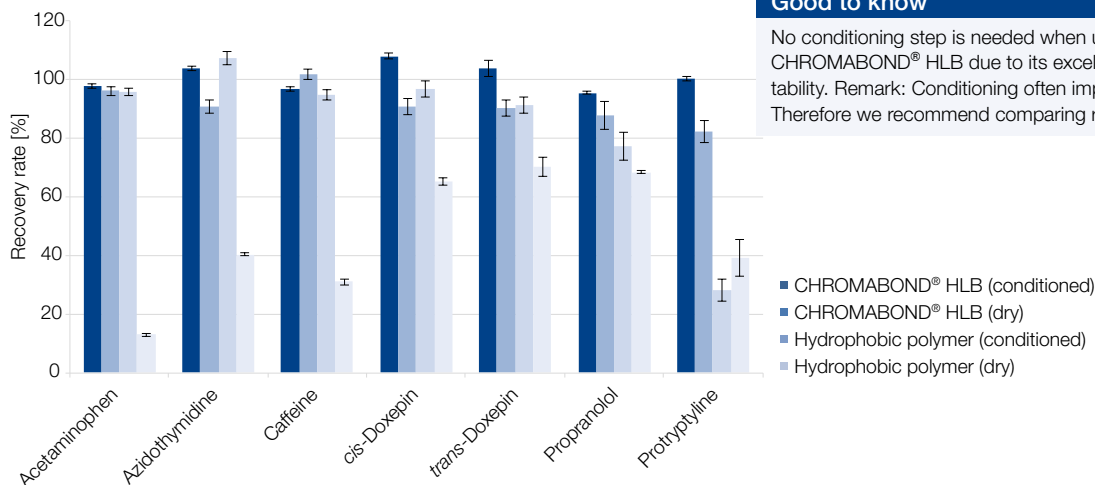
MN Appl. No. 306320

|   |                      |  |
|---|----------------------|--|
|  | Columns*:            | CHROMABOND® HLB, 1 mL, 30 mg<br>Hydrophobic polymer, 1 mL, 30 mg |
|   | MN REF:              | 730921   |
|   | Column conditioning: | 1 mL methanol, 1 mL dest. water                                  |
|   | Sample application:  | 1 mL serum (spiked with 10 µg/mL of each analyte)                |
|   | Washing:             | 1 mL dest. water   |
|   | Drying:              | 10 min with applied vacuum                                       |
|   | Elution:             | 2 mL methanol  |
|   | Evaporation:         | under nitrogen, 40 °C  |
|   | Reconstitution:      | in 1 mL dest. water + 0.1 % formic acid                          |

Further analysis: HPLC, according to MN Appl. No. 128110

|   |              |  |
|---|--------------|--|
|  | Column:      | EC 150/2 NUCLEODUR® C <sub>18</sub> Pyramid,<br>3 µm   |
|   | MN REF:      | 760261.20  |
|   | Eluent:      | A: dest. water + 0.1 % formic acid<br>B: methanol + 0.1 % formic acid<br>30–45 % B in 15 min |
|   | Flow rate:   | 0.3 mL/min   |
|   | Temperature: | 30 °C  |
|   | Detection:   | UV, 254 nm   |
|   | Injection:   | 5 µL   |

Recovery rates ± RSD [%], n = 5



### Good to know

No conditioning step is needed when using CHROMABOND® HLB due to its excellent water wet-ability. Remark: Conditioning often improves analyte recovery. Therefore we recommend comparing results.



\* Same conditions for all used columns. Due to a better comparability CHROMABOND® HLB and Oasis® HLB adsorbents (60 µm) were packed into equal column hardware. The shown chromatograms may not be representative of other applications.



# CHROMABOND® HLB

## Ordering information

| Volume   | Adsorbent weight → |            |             |             |             |            |        | Pack of |
|--|--------------------|------------|-------------|-------------|-------------|------------|--------|---------|
|  | 30 mg              | 60 mg      | 100 mg      | 150 mg      | 200 mg      | 500 mg     | 1 g    |         |
| CHROMABOND® HLB polypropylene columns (60 µm)            |                    |            |             |             |             |            |        |         |
| 1 mL   | 730921             |            | 730922      |             |             |            |        | 30      |
| 3 mL   |                    | 730923     |             |             | 730924      | 730925     |        | 30      |
| 6 mL   |                    |            |             | 730944      | 730926      | 730927     |        | 30      |
| 15 mL  |                    |            |             |             |             | 730928     | 730929 | 20      |
| CHROMABOND® HLB polypropylene columns (60 µm) · BIGpacks |                    |            |             |             |             |            |        |         |
| 3 mL   |                    | 730923.250 |             |             | 730924.250  |            |        | 250     |
| 6 mL   |                    |            |             |             | 730926.250  | 730927.250 |        | 250     |
| CHROMABOND® HLB polypropylene columns (30 µm)            |                    |            |             |             |             |            |        |         |
| 1 mL   | 730921P30          |            | 730922P30   |             |             |            |        | 30      |
| 3 mL   |                    | 730923P30  |             |             | 730924P30   |            |        | 30      |
| 6 mL   |                    |            |             | 730944P30   |             |            |        | 30      |
| CHROMABOND® LV-HLB (30 µm)                               |                    |            |             |             |             |            |        |         |
| 15 mL  | 732140             | 732141     |             |             |             |            |        | 30      |
| Size →   | S                  |            |             | M           |             | L          |        | Pack of |
| Adsorbent weight →                                       | 120 mg             |            |             | 220 mg      |             | 510 mg     |        |         |
| CHROMAFIX® HLB cartridges (60 µm)                        |                    |            |             |             |             |            |        |         |
|  |                    |            | 731921      | 731922      | 731923      |            |        | 50      |
| Adsorbent weight →                                       | 96 x 10 mg         |            |             | 96 x 30 mg  |             | 96 x 60 mg |        |         |
| CHROMABOND® MULTI 96 HLB (60 µm)                         |                    |            |             |             |             |            |        |         |
|  |                    |            |             |             | 738920.060M |            |        | 1       |
| CHROMABOND® MULTI 96 HLB (30 µm)                         |                    |            |             |             |             |            |        |         |
|  |                    |            | 738921.010M | 738921.030M |             |            |        | 1       |

### Registered trademarks

|             |  |
|-------------|--|
| Oasis®      | Waters Corp. (USA)                     |
| CHROMABOND® | MACHEREY-NAGEL GmbH & Co. KG (Germany) |
| CHROMAFIX®  | MACHEREY-NAGEL GmbH & Co. KG (Germany) |
| FREESTYLE®  | LCTech GmbH (Germany)                  |

Your local distributor

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